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MEASURING THE EFFECT OF ALTITUDE ON THE RADIUS OF A SPRINKLER

Adriaan van Niekerk Pr Eng

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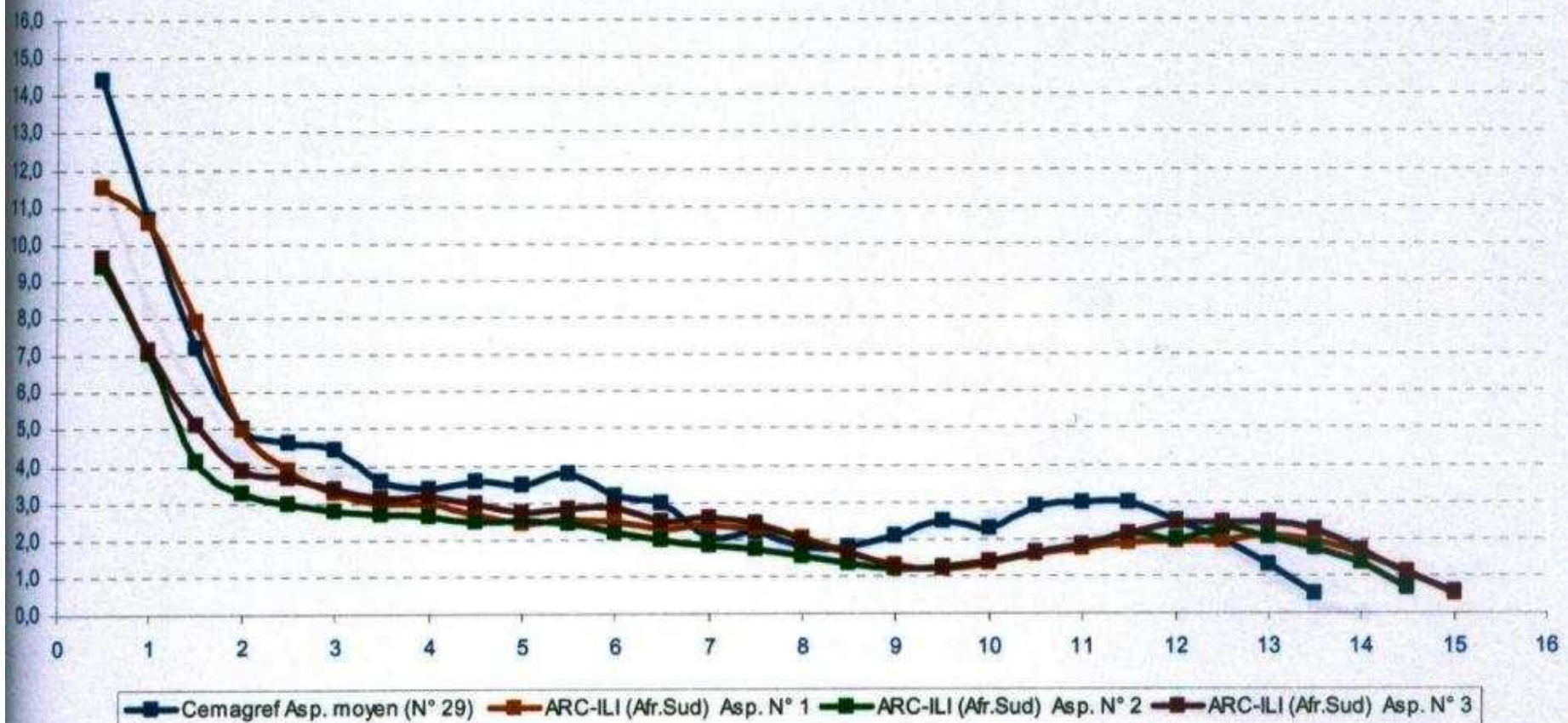
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POINTS OF IMPORTANCE

- Introduction
- Factors affecting sprinkler range
- Mobile test bench
- Test method
- Processing of measurements
- Test results
- Case studies
- Conclusion

South Africa

Essai inter-laboratoires Afrique du Sud
Comparaison avec l'asperseur moyen (N° 29) à 2,5 bars

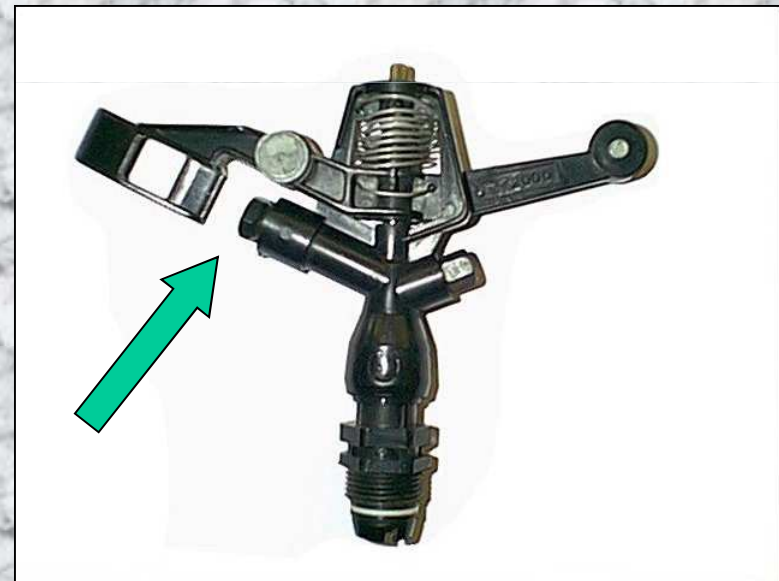


FACTORS AFFECTING SPRINKLER RANGE

- **Nozzle size**
- **Vertical angle**
- **Operating pressure**
- **Mounting height**
- **Rotation speed**
- **Upright or slanting**
- ***Altitude***

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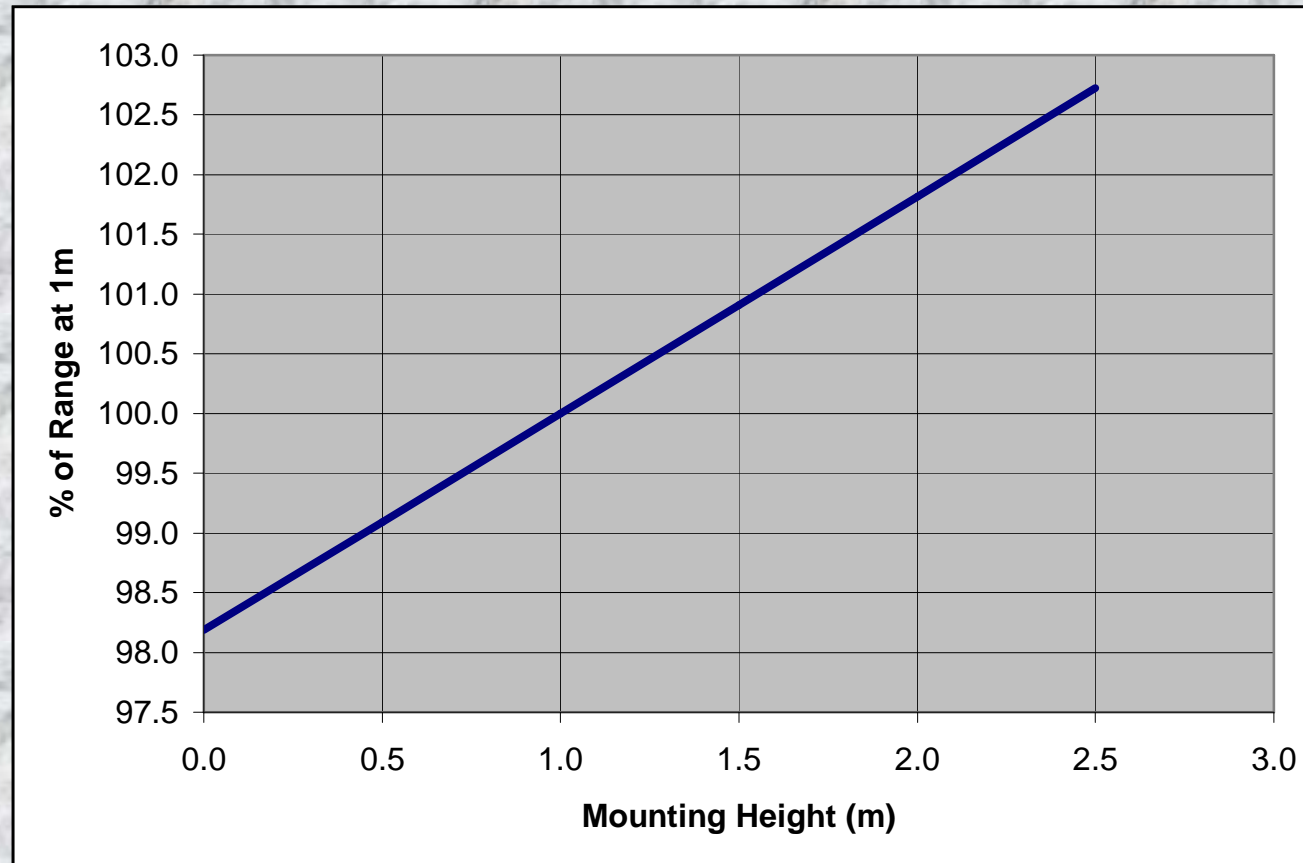


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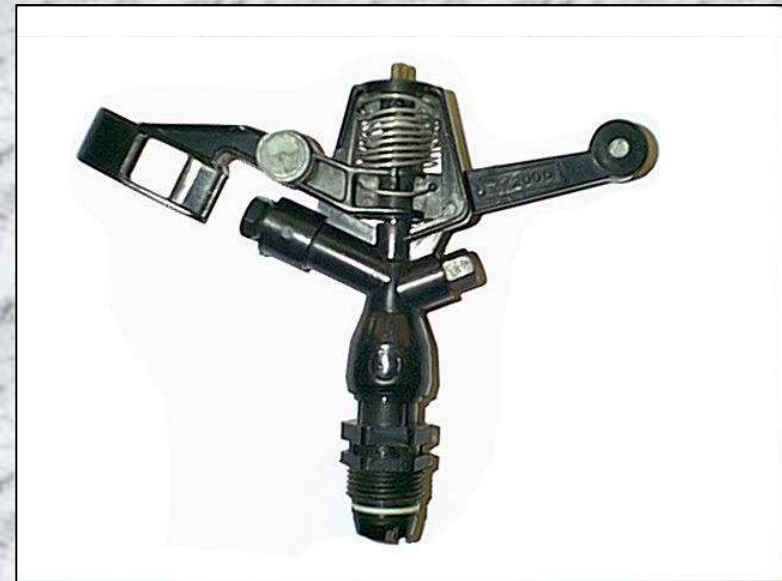


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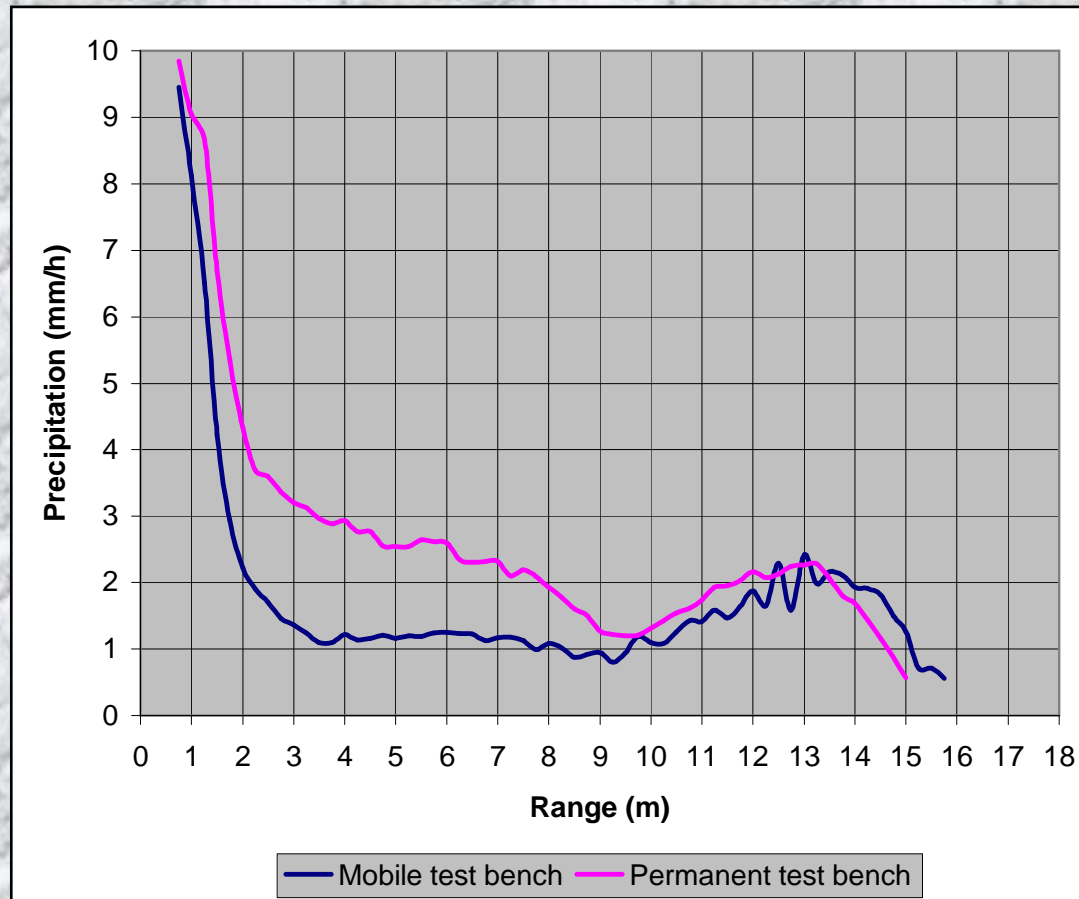
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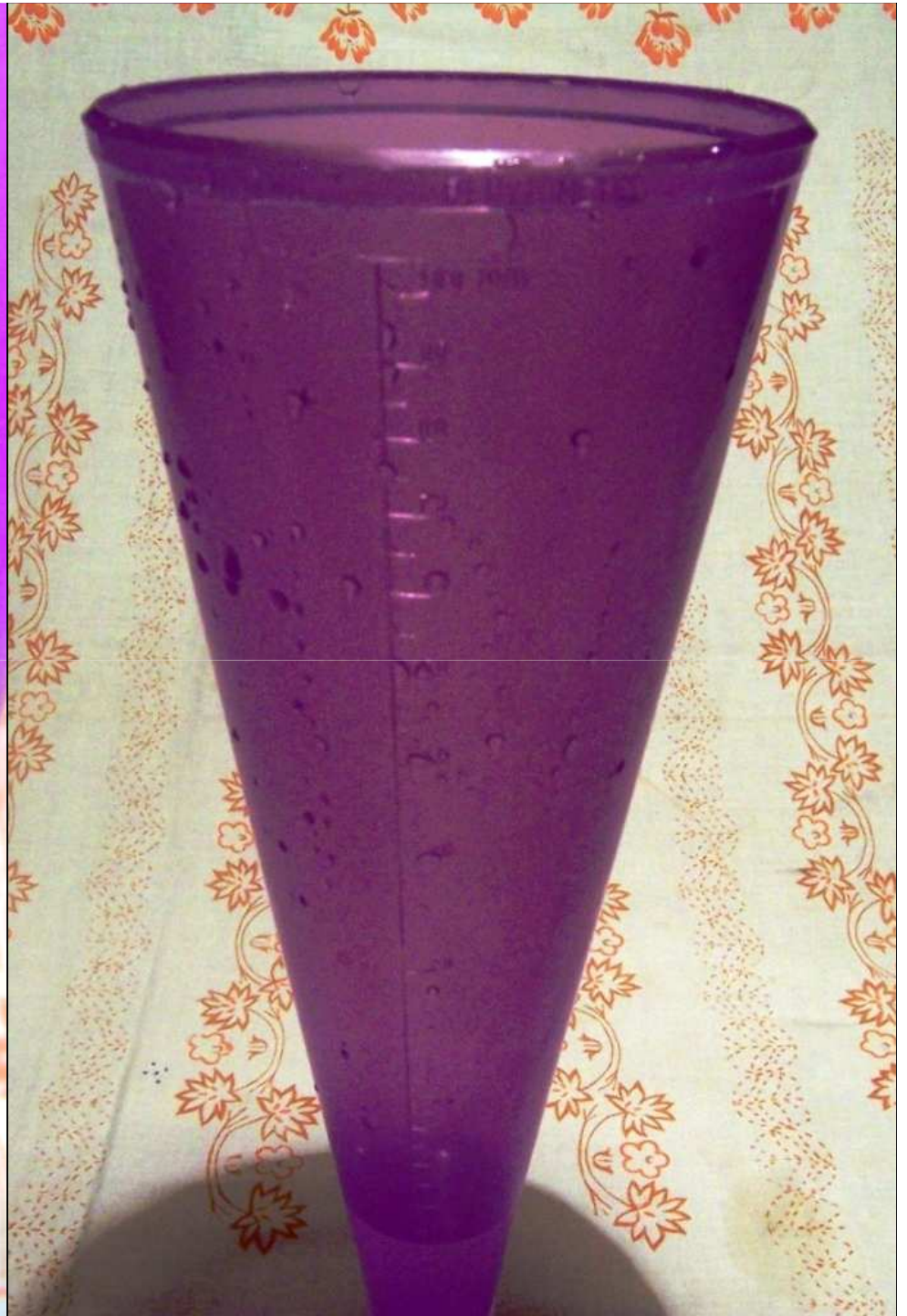
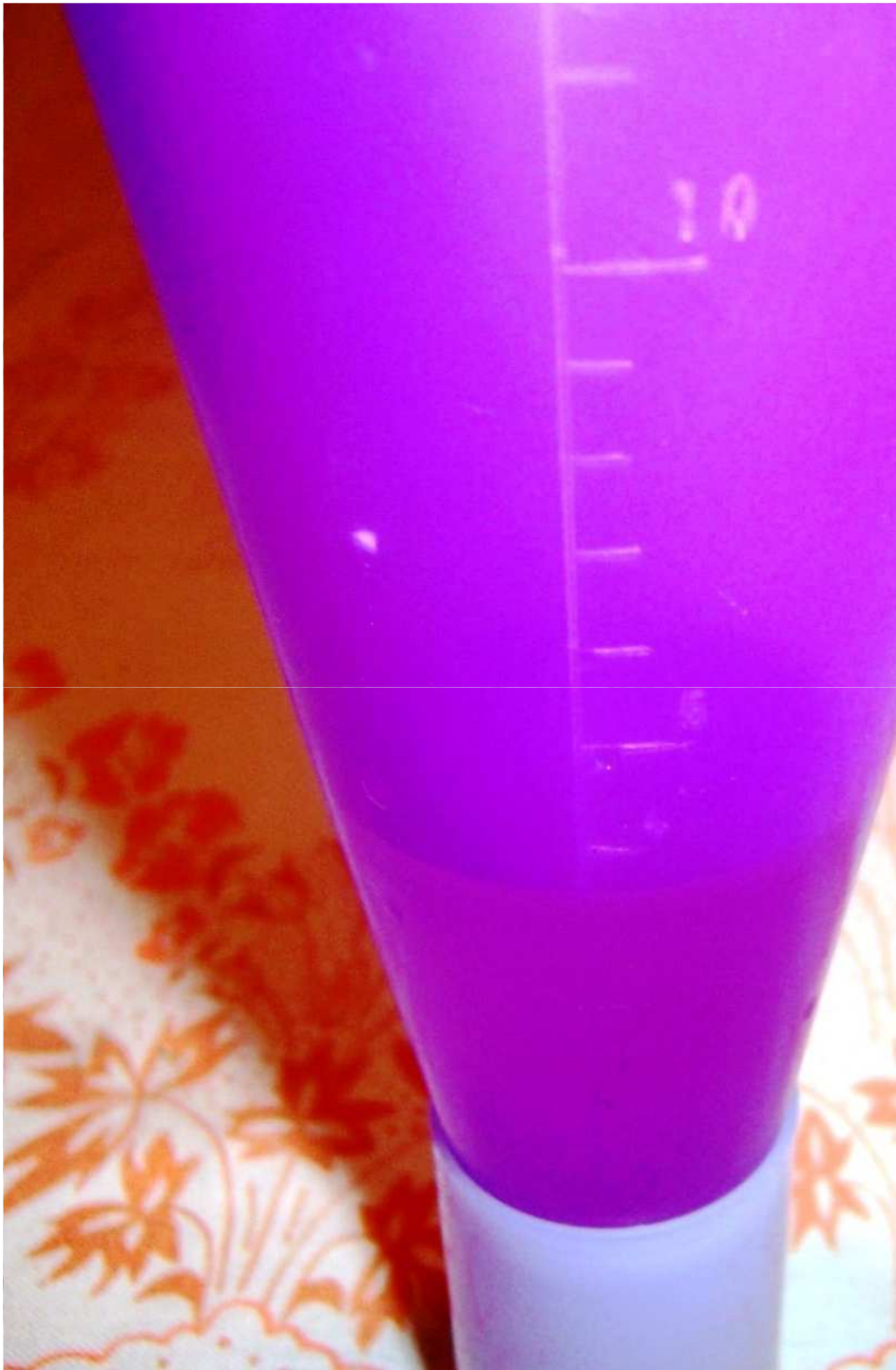
FACTORS AFFECTING SPRINKLER RANGE



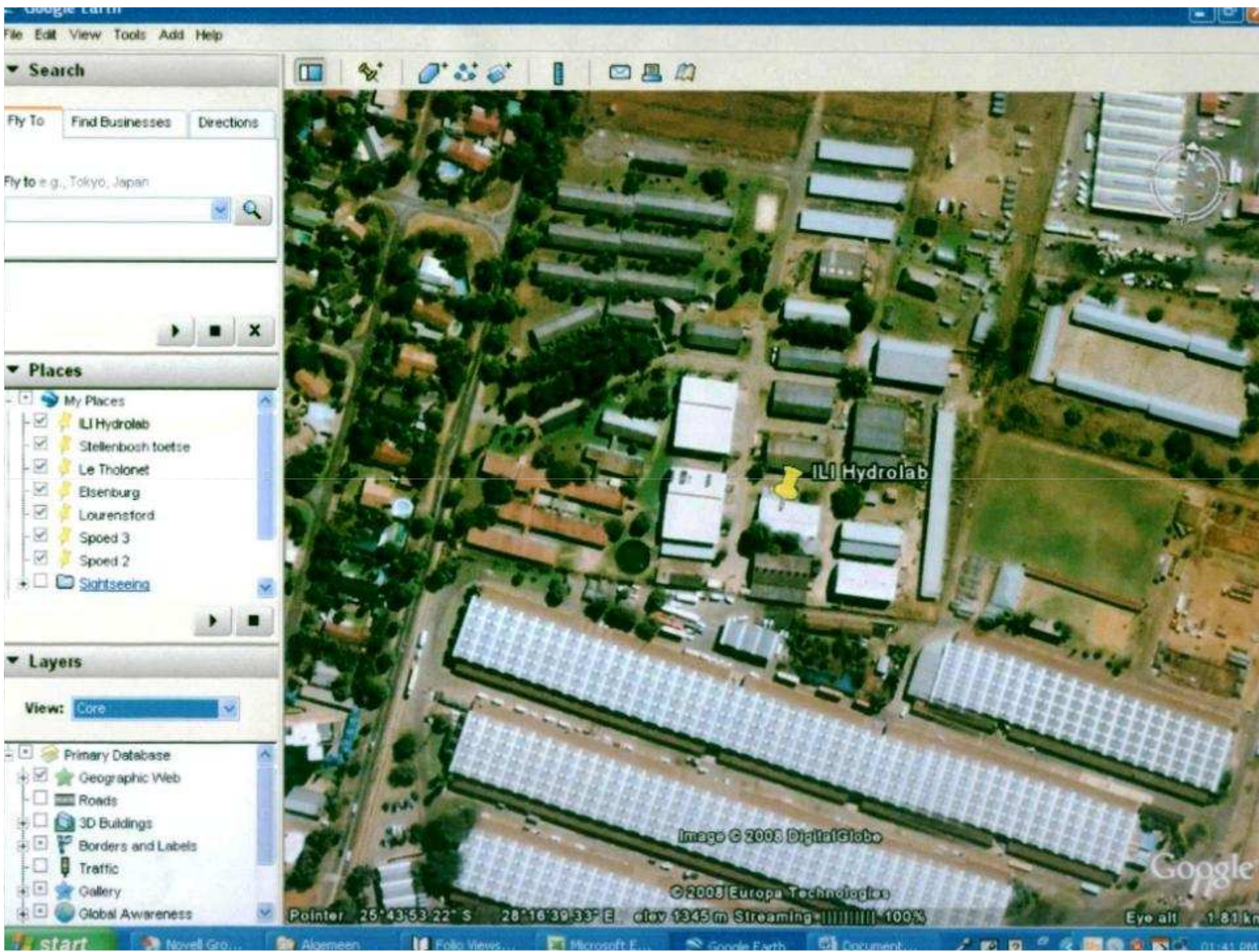
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 - 3D Buildings
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 - Gallery
 - Global Awareness

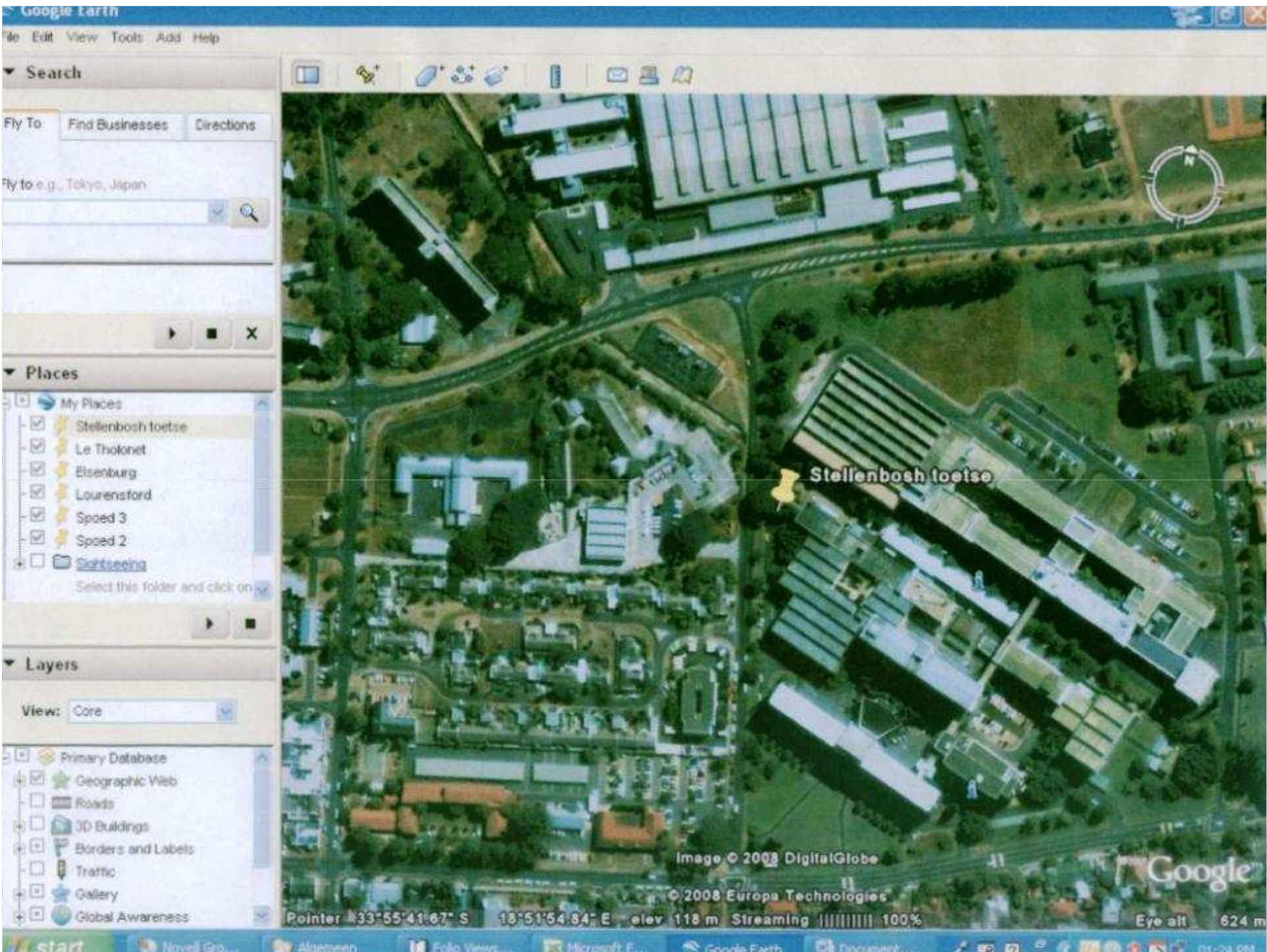


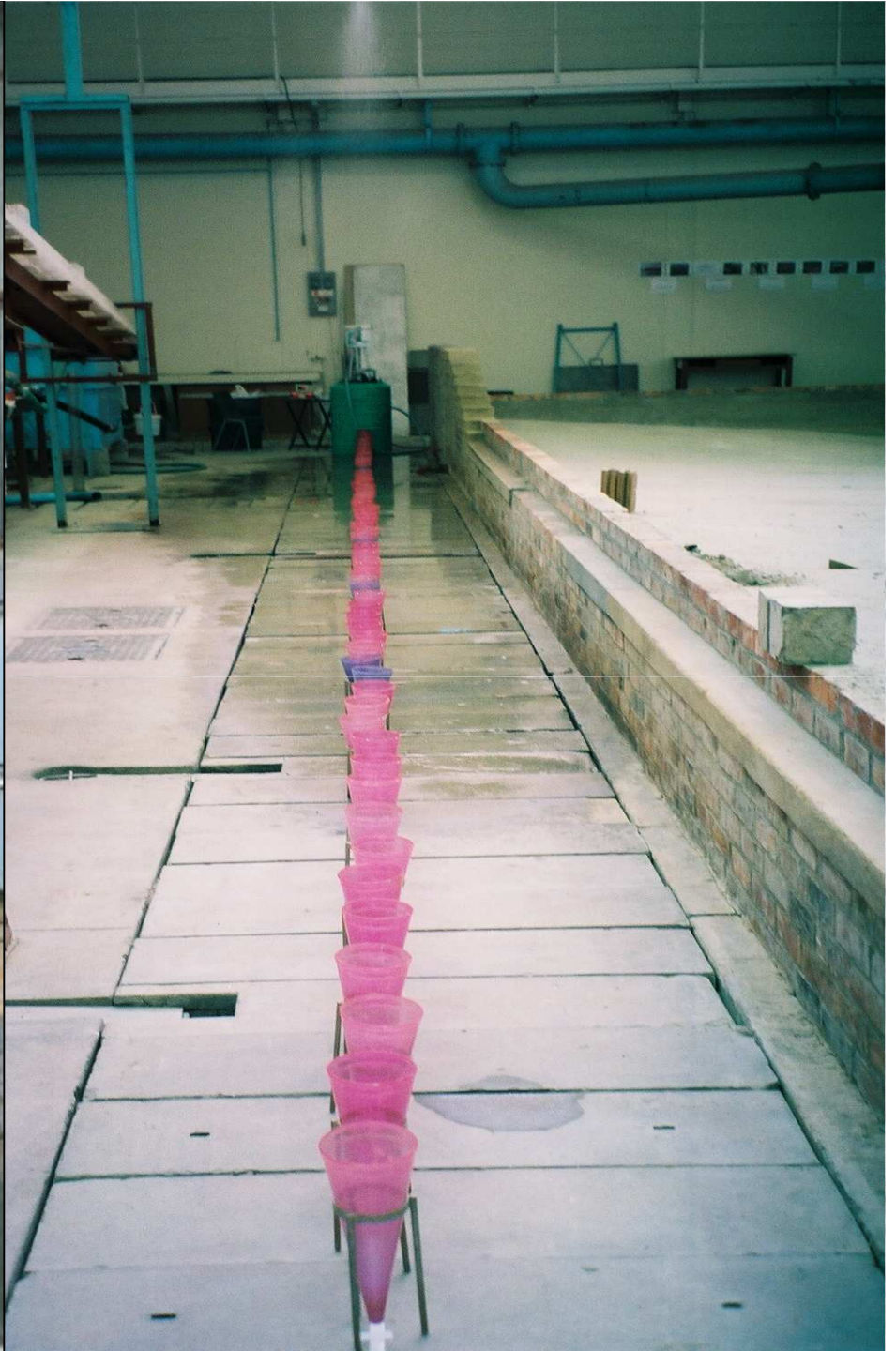
Image © 2005 DigitalGlobe

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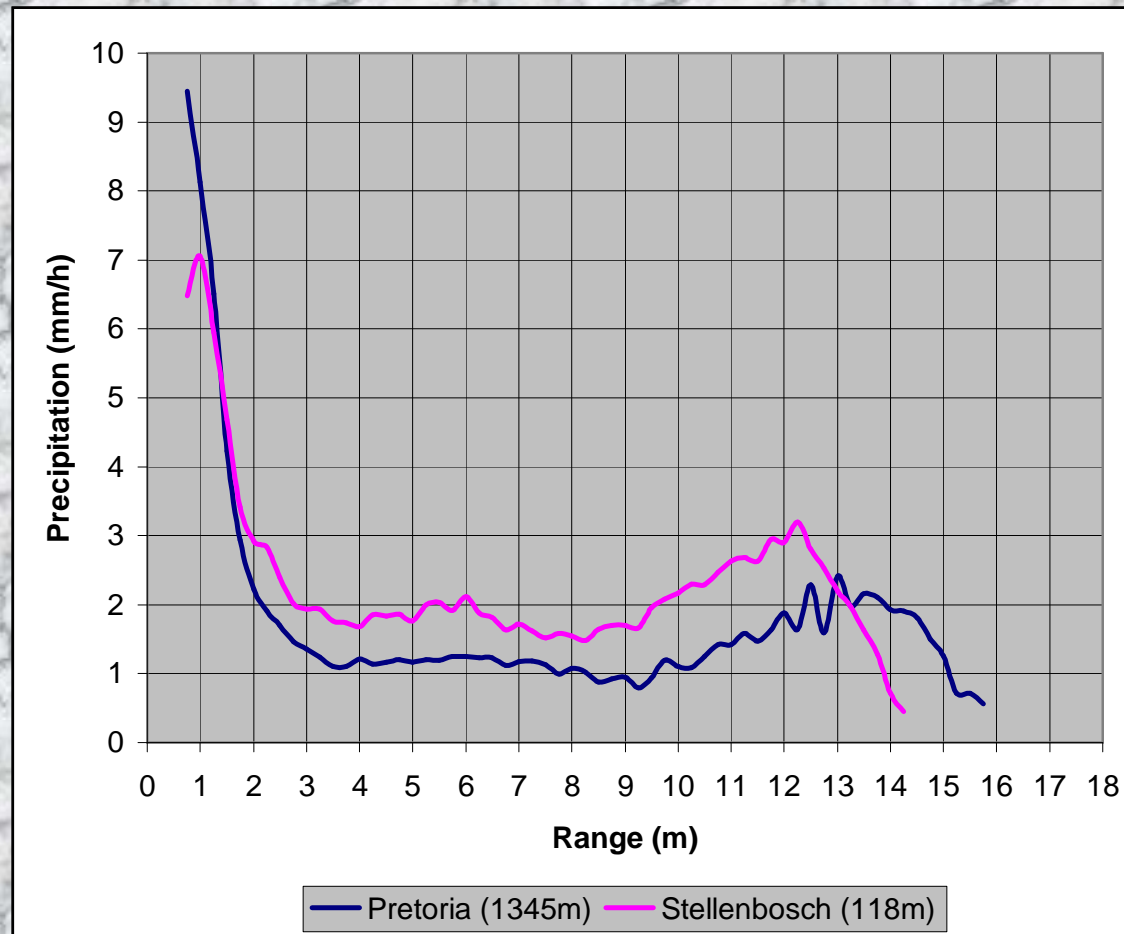
Pointer 25°43'53.22" S 28°16'39.33" E elev 1345m Streaming 100%

Eye alt 1.81 km

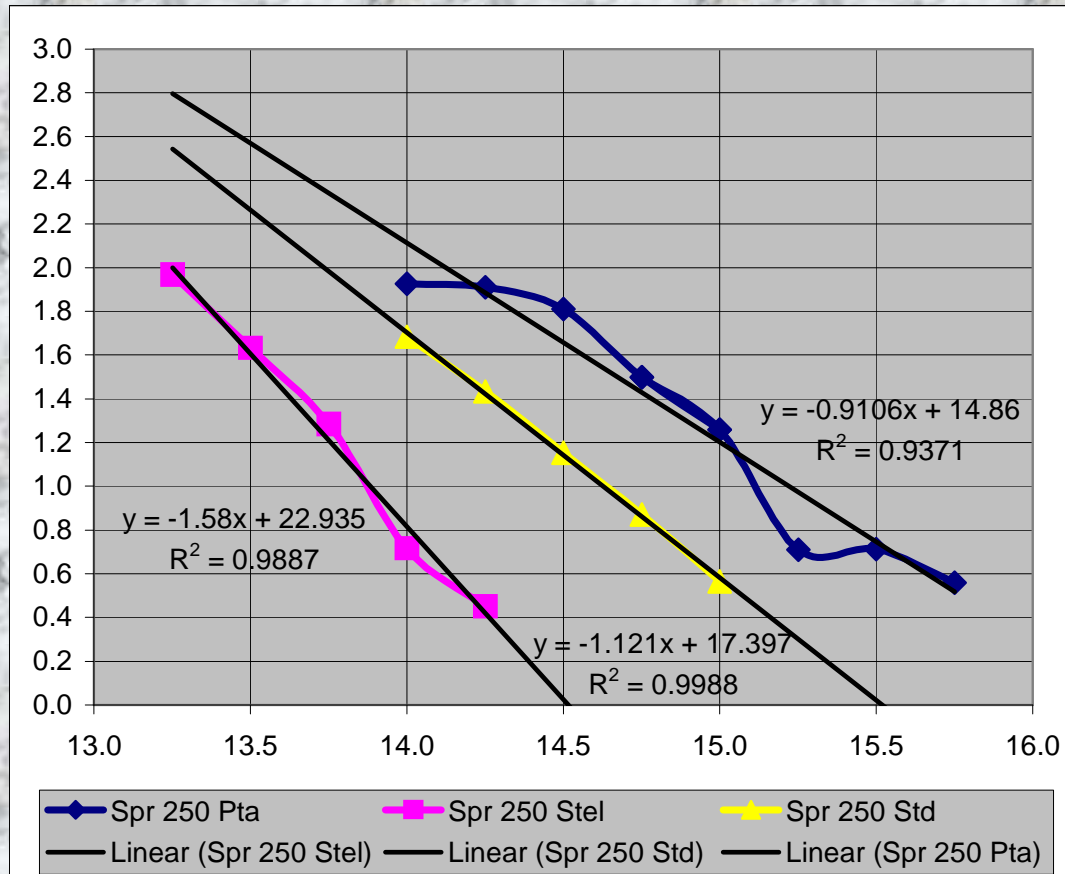




THE TEST METHOD



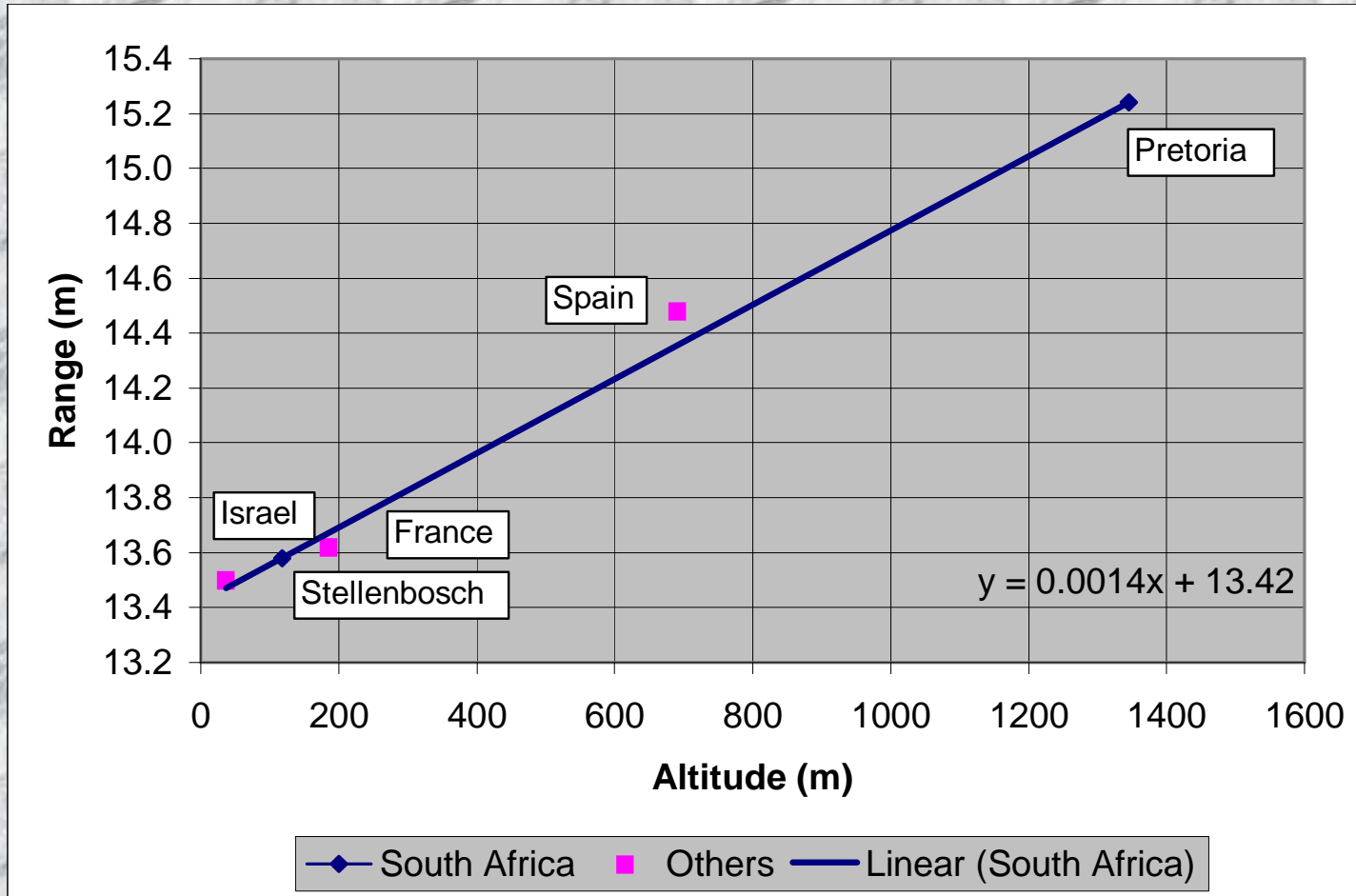
THE PROCESSING OF MEASUREMENTS

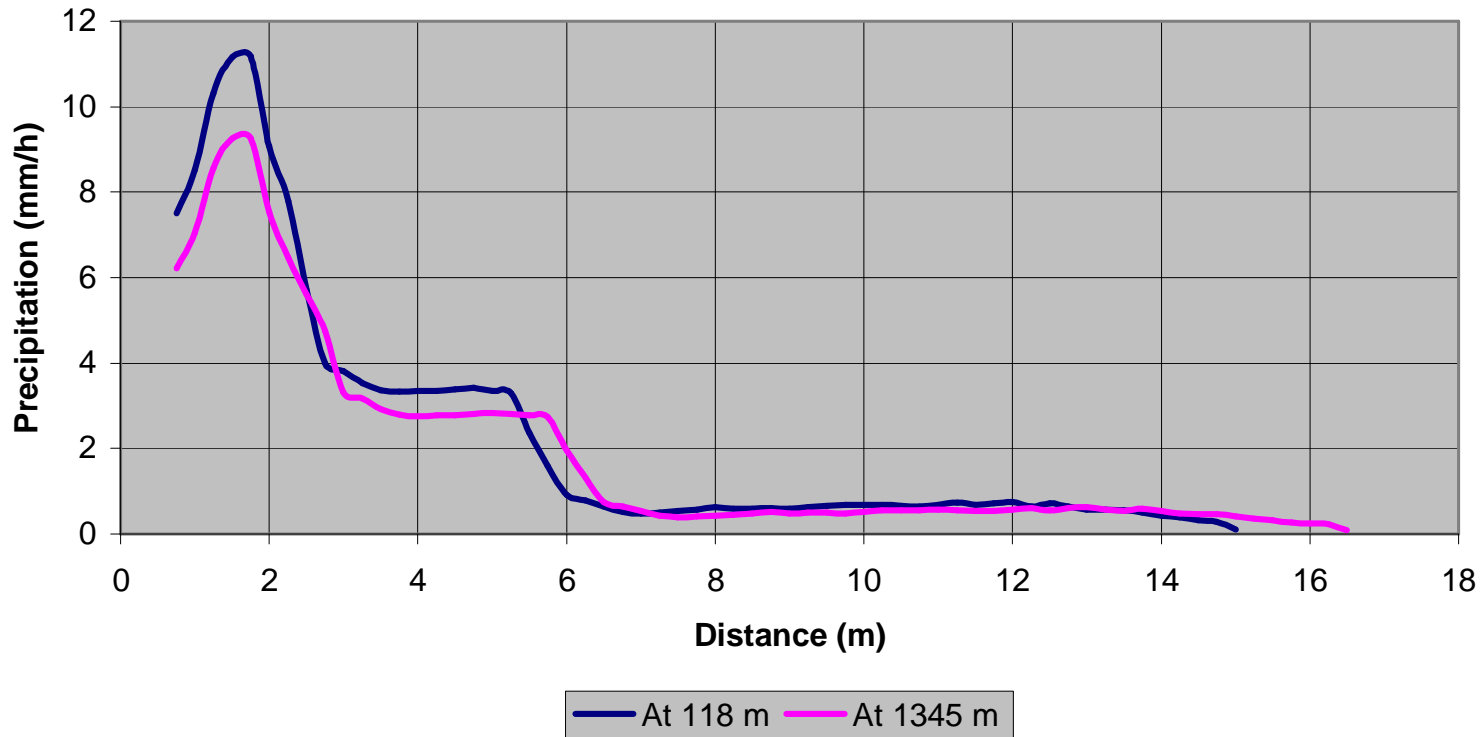


TEST RESULTS

Test bench	Pretoria	Stellenbosch/France*	Difference
Mobile test bench	15,99 m	14,33 m	1,66 m
Mobile test bench compensated (fig. 4)	15,24 m	13,58 m	1,66 m
Permanent test bench	15,25 m	*13.62 m	1,51 m

TEST RESULTS



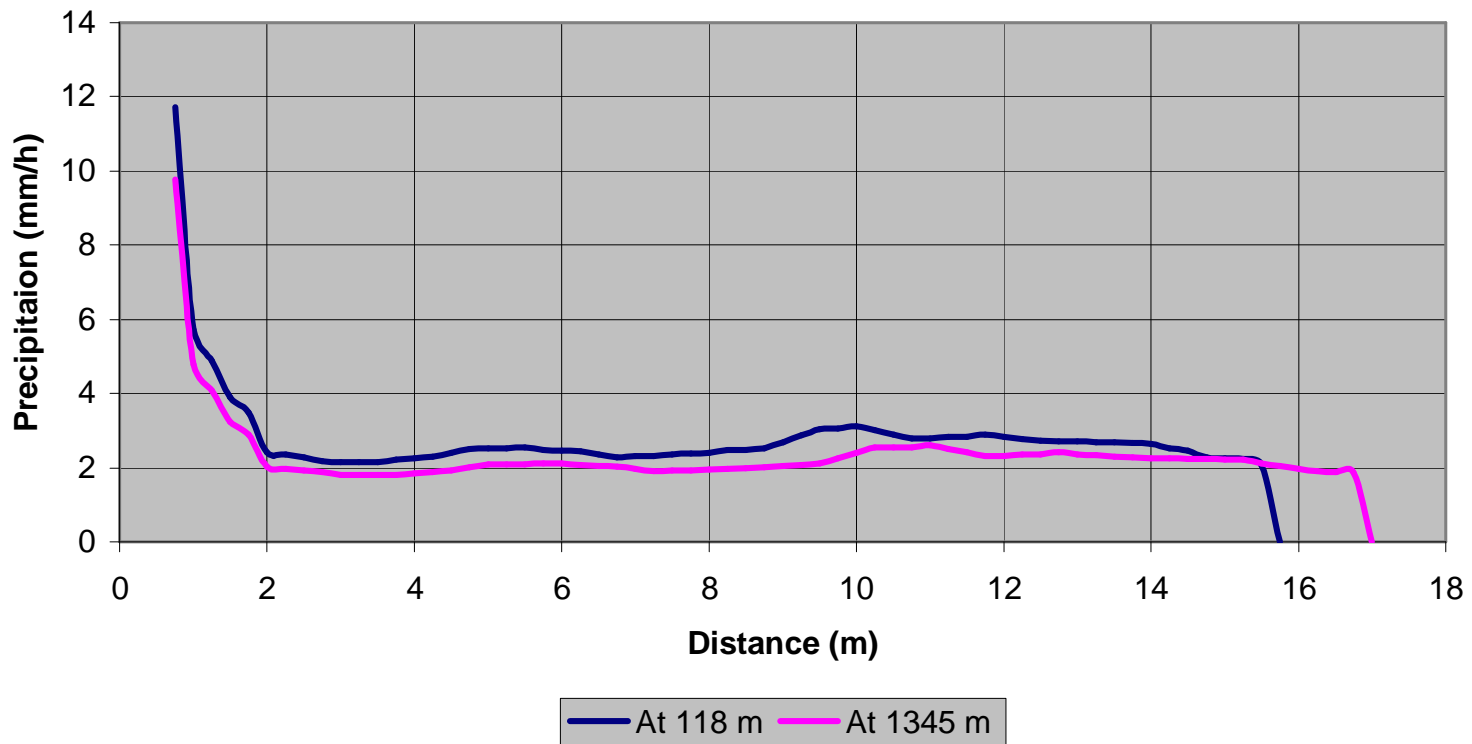


At 118 m:

Type of spacing:	Rectangular	Area
Maximum sprinkler spacing:	18 m	162 m ²
Maximum lateral spacing:	9 m	
Average application rate:	3.2 mm/h	
Maximum radius:	15.25 m	

At 1345 m:

Type of spacing:	Rectangular	Area
Maximum sprinkler spacing:	18 m	216 m ²
Maximum lateral spacing:	12 m	33 %
Average application rate:	2.7 mm/h	
Maximum radius:	16.75 m	

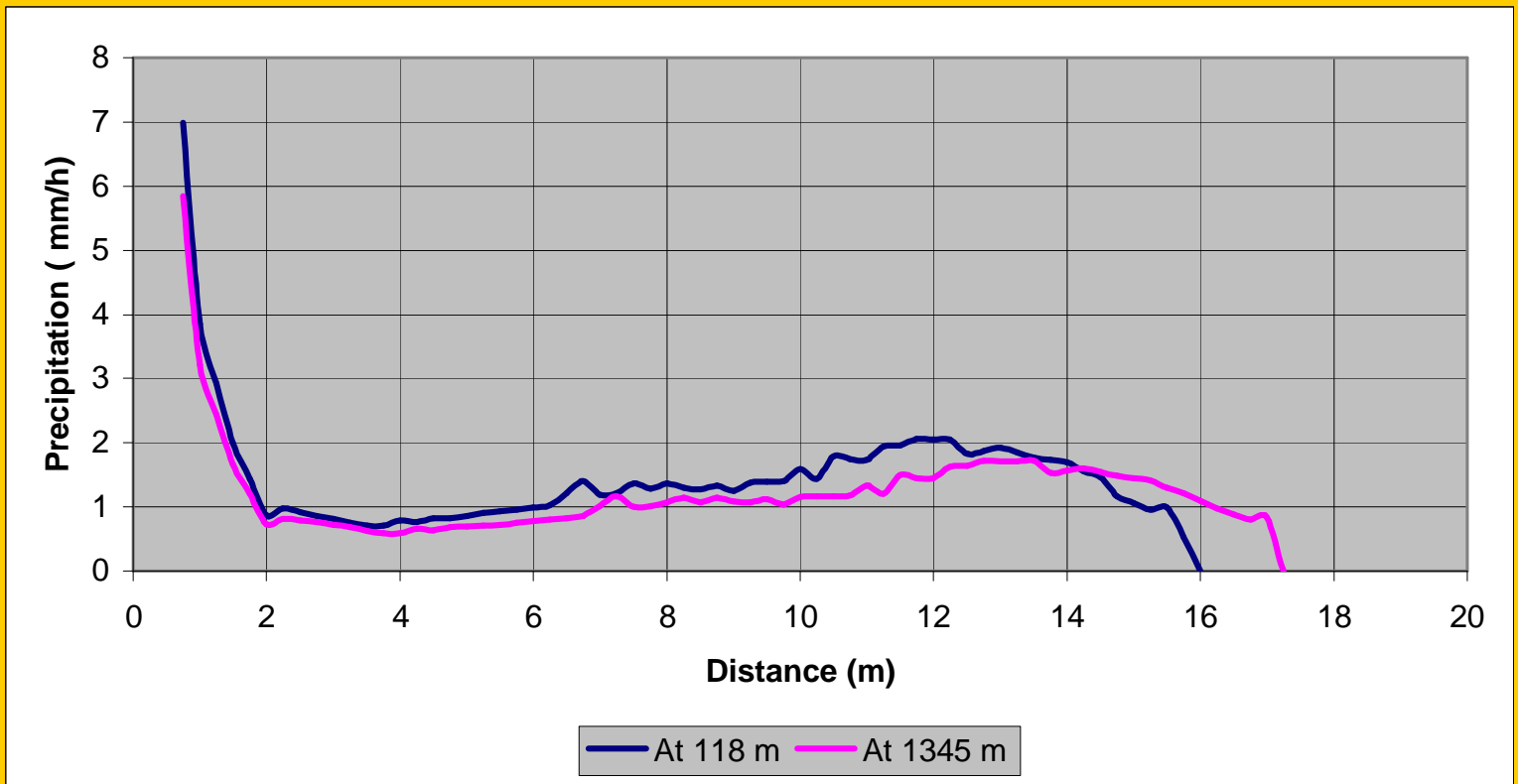


At 118 m:

Type of spacing:	Triangular	Area
Maximum sprinkler spacing:	18 m	135 m ²
Maximum lateral spacing:	15 m	
Average application rate:	7.5 mm/h	
Maximum radius:	15.75 m	

At 1345 m:

Type of spacing:	Triangular	Area
Maximum sprinkler spacing:	18 m	135 m ²
Maximum lateral spacing:	15 m	0 %
Average application rate:	6.3 mm/h	
Maximum radius:	17.25 m	



At 118 m:

Type of spacing:	Triangular	Area
Maximum sprinkler spacing:	18 m	108 m ²
Maximum lateral spacing:	12 m	
Average application rate:	5.3 mm/h	
Maximum radius:	16.00 m	

At 1345 m:

Type of spacing:	Triangular	
Maximum sprinkler spacing:	18 m	135 m ²
Maximum lateral spacing:	15 m	25 %
Average application rate:	4.4 mm/h	
Maximum radius:	17.50 m	

CONCLUSION

With the mobile sprinkler test bench it was possible to establish a relation between the altitude at which a sprinkler is used and its range. It could be confirmed that a sprinkler has a longer range at higher altitudes with the result that sprinklers can be spaced wider without losing uniformity and which can result in noticeable savings on the cost of these systems.



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